

## INTRAPERITONEAL RUPTURE OF THE URINARY BLADDER.

WITH REPORT OF A CASE OPERATED TWO HUNDRED AND FIFTY-FOUR  
HOURS AFTER ACCIDENT; WITH RECOVERY.

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On Sept. 28, 1904, a man was brought to Cook County Hospital, Chicago, with intraperitoneal rupture of the urinary bladder. Eleven days previous to admission he had received an abdominal injury, since which he had suffered from anuria and a progressive abdominal distension. He was operated two hundred and fifty-four hours after the accident, and was discharged from the hospital on the tenth day well.

The time element is the important and interesting feature in this case. It is unique in medical literature. Two hundred and fifty-four hours after the abdominal injury laparotomy was performed, the bladder sutured, and the patient made an uneventful recovery. Blumer (*British Med. Journal*, 1903, 1, 789) reported a case operated the sixth day after injury, with recovery. I believe Blumer's case has the longest intervening time from injury to operation of successful cases reported to date.

CASE REPORT.—F. G., a laborer, 45 years of age, was brought to the receiving ward of Cook County Hospital in the police ambulance, Sept. 28, 1904, at 6.17 P. M. He stated that ten days previous to admission he had been carousing and drinking during almost the entire night. About 4 A. M. he became involved in a brawl and was kicked several times in the right side just above the crest of the ilium and about the trochanter major. He had considerable pain in the abdomen and at the seat of injury at the time, and had to be taken home. In a few hours he felt better and tried to work for the following two days. But

the pain in the abdomen became so severe that he had to quit work on the second day. About the time he quit work he noticed that the abdomen was somewhat distended and since that time the swelling had gradually, but slowly, increased in size. Ever since he was injured he has been unable to void much urine, but has had very frequent desire to urinate, only a few drops being voided at a time. Since the injury what urine he has passed has been distinctly bloody. For the past eight days the abdominal pain has been very severe, and he has vomited several times a day. He thinks he has had no fever since the injury. There is a distinct alcoholic history extending over many years.

He was a fairly well developed, middle-sized man, past middle age of life. He lay on his side with legs drawn up. He complained of great distress in his abdomen and vomited during examination. Skin dry and cool. Pulse considerably accelerated, regular but very weak. Respiration somewhat rapid. Abdomen markedly distended, tense, with shining walls. Umbilicus protruding, subcutaneous veins prominent. On palpation there was some tenderness over entire belly. Percussion showed dullness over entire abdomen. A distinct impact was given on tapping the abdominal wall anywhere. There was no evidence of contusion of abdominal wall. Remaining examination had no points of interest.

The catheter was then passed and 5,800 cc. of blood-tinged urine was withdrawn. Abdominal distension disappeared and tympany obtainable, but still signs of fluid in abdomen. The record at this time shows temperature, 98; pulse, 108; respiration, 24. Patient was sent to operating room. The following notes are taken from history sheet:

*"Operation.*—Operator, Dr. George F. Thompson. Incision in median line four inches long, beginning one inch above symphysis pubis. Abdominal cavity opened. About 2,000 cc. bloody urine found free in peritoneal cavity. On superior surface of the bladder in median line was an opening with ragged edges, which admitted the thumb rather tightly. Opening in bladder sutured by Czerny-Lembert method, using medium-sized silk sutures. Abdominal cavity flushed with normal salt solution. Serosa smooth and shining. Peritoneum and abdominal wall closed by separate layer method."

Bladder was drained for five days by means of catheter through urethra. The patient made an uneventful recovery, temperature never being above 100.6°.

It is noteworthy in this case that the patient performed his work as a laborer an entire day after the accident, and was not compelled to take to bed until the second day was well advanced. The symptom of shock was entirely absent, it being most probably that the patient had to be taken home after the injury more on account of intoxication than on account of the injury itself.

Yet, it is well known that serious injury to persons under the influence of alcohol often lacks just this element of shock, which is so important in the diagnosis of internal injuries. So, too, is rupture of the urinary bladder a relatively common occurrence in intoxicated persons, owing to the distension of the organ and to the dangers of trauma in this condition. On this point I quote Dr. Ashhurst (*Am. Jour. Med. Sc.*, July, 1906).

Another predisposing cause of importance is the condition of intoxications. Over 72 per cent. of the patients in whose records this point is mentioned, are reported as being more or less drunk at the time of the injury, and it is a sad fact that in not a few instances in which the patients themselves were sober, they sustained their injuries because of intoxication in some one else (Rose, Zoldewitch). Not only does drunkenness predispose to injury in this way, by making the individuals both quarrelsome and unsteady on their feet, but it increases the amount of urine excreted, and by dulling the sensibilities renders the persons so affected often unconscious that their bladders are overdistended, and may even deprive them, when drunkenness is a long continued habit, of the power of completely evacuating their bladders. The result of this last state—atonny of the bladder—is that, although the patient may have passed his urine within an hour or so of the accident, his bladder may still be quite sufficiently distended to predispose it to rupture when subjected to sudden injury. Another serious aspect of intoxication in these patients is that they frequently remain unconscious of the gravity of their injury, as in the case of my own patient, and sleep off their drunken state only to awake the next morning with a peritonitis fully developed, which could almost certainly have been prevented by prompt operation.

It is worthy of note that among the patients who were intoxicated at the time of the accident, the mortality was over 43 per cent; while among the sober it was less than 28 per cent.

I shall not follow further the questions of symptoms and diagnosis, because these points have recently been exhaustively treated in Dr. Ashhurst's paper.

Herrick<sup>25</sup> reported the cases occurring in Cook County Hospital, 1889 to 1893. Out of a total of 8,000 surgical cases there were five of rupture of the bladder; an incidence of .0625 of 1 per cent. St. Bartholomew's Hospital report, quoted by Herrick, mentions but two cases out of 16,711 surgical cases occurring in the years 1869 to 1875, an incidence of .0125 of 1 per cent. At the Episcopal Hospital, Philadelphia, from January 1, 1900, to January 1, 1905, there were 8,367 surgical patients with three intraperitoneal ruptures of the urinary bladder, or .037 of 1 per cent. (Ashhurst).

The question of cirrhosis of the liver with ascites was brought prominently to the fore in discussing the differential diagnosis of this case. With the marked alcoholic history, the enormous distension of the belly with fluid, prominent veins—these spoke volumes for portal obstruction. The history of injury eleven days previous made one hesitate to pronounce rupture of the bladder on account of the good general condition of the patient, for the common text-book leads one to expect a rapidly fatal issue. However, Ullman cites from the literature a case which died on the sixteenth day. A case is recorded by Ledderhose which survived the immediate results of the injury, and recovered after the opening on the seventeenth day, of an intraperitoneal abscess in communication with the bladder.

The sudden development of ascites following trauma, the strangury, blood from urethra, and the practical anuria for eleven days made the diagnosis of intraperitoneal rupture of the urinary bladder the most probable. The passage of the catheter was decisive.

The academic question of peritonitis following rupture of the bladder is an interesting one. If an aseptic urine does not produce peritonitis in eleven days, how many days are necessary? I believe the proposition that peritonitis is

not an inevitable sequence is easily tenable. Therefore, soundings and catheterizations must always be made with utmost caution in all suspected cases.

Samuel Alexander<sup>1</sup>, in reporting forty-five cases, his own and from the literature, stated that the time elapsing between accident and operation varied from two to ninety hours. Until Blumer's<sup>24</sup> case on the sixth day with a successful issue, ninety hours was the longest time elapsing. In this reported series of forty-five, twenty-three died,—sixteen from peritonitis, two shock, two hæmorrhage, one pneumonia, and two died on table. In four cases peritonitis was due to imperfect suturing. In eighteen cases no drainage was used,—nine recovered, nine died. In twenty-one cases catheter introduced into bladder and retained several days,—eleven recovered, ten died. Two cases, bladder drained by suprapubic method, and both recovered. Jones<sup>2</sup> added nine cases to the Alexander series, and, in commenting on these, states<sup>4</sup>: Thirty-two reported prior to 1893 had a death rate of  $63\frac{1}{2}$  per cent.; twenty-two reported since 1893 had a death rate of  $27\frac{1}{2}$  per cent.,—thus showing an improvement of 36 per cent.

In Ashhurst's recent report of one hundred and ten cases sixty-three patients recovered and forty-seven died, a mortality of 42.72 per cent. To this series we may add Mar-nock's two with no mortality, M. L. Morel's four cases with one death, and the case herein reported, making a total of one hundred and seventeen. Of these sixty-nine recovered and forty-eight died, a mortality of 41.02 per cent. for all reported cases. If to Jones' twenty-two cases reported occurring since 1893 we add the seven recent cases, out of a total of twenty-nine seven died, a mortality of 24.1 per cent. Thus we note the gradually lessening rate of mortality under asepsis, and modern methods of diagnosis and treatment.

Willett<sup>9</sup> reported a case in 1876, Heath<sup>9</sup> in 1879, Bull<sup>9</sup> in 1885, all three dying from imperfect suture. McGill<sup>9</sup> reported a case in 1886 which died from operative shock.

MacCormac<sup>12</sup> in 1886 reported two cases, the first successful ones on record, in which there was celiotomy and suture. He ascribed his success to the fact that he sutured only the musculature and serosa, while previous operators had always included the mucosa. Before MacCormac's triumph in bladder suturing, practically all patients with intraperitoneal rupture were doomed to die. Ullman<sup>16</sup> collected 143 cases prior to 1886, only two of which recovered.

While a complete analysis of the literature with reference to the mechanism in intraperitoneal rupture of the urinary bladder was not made, the most common is from blows on belly wall by some blunt instrument, the booted foot playing a prominent rôle.

Intraperitoneal rupture also occurs in fracture of the pelvis from crushing injuries, but is usually associated with extraperitoneal rupture as well. Sugetinow<sup>3</sup> reports a case of intraperitoneal rupture due to heavy lifting. During the excessive physical effort the patient felt a sudden, tearing pain in the lower abdomen. The patient lay in bed five days in a serious condition, but from the obscurity of the symptoms, diagnosis was not made. On the fifth day he was again seized with severe pain. The fatal issue occurred on the eighth day. Autopsy showed purulent peritonitis from rupture of the bladder. Sugetinow believed the rupture involved only the mucous and muscular coats until the fifth day. Intraperitoneal rupture has been reported in cases of vesical cancer. This accident must be kept in mind in dealing with this condition as the life of the patient can be considerably prolonged by either permanent suprapubic or perineal drainage. Loumeau reports a case in which he shows that lithotrity in inexperienced hands may result in laceration of the bladder, and, on account of the non-repair of the accidental lesion, may be followed by leakage and fatal peritoneal infection. The same author mentions another case that is an example of mixed rupture, spontaneous in appearance but in reality produced by a trauma dating back thirty years, a hypo-

gastric traumatism received at that time resulted in contusion of the bladder with a prevesical hematoma followed by adhesions between the bladder and the abdominal wall. These adhesions under the influence of violent and repeated movements, finally broke away from the walls of the bladder at their point of implantation on the organ, from which resulted a tear in the bladder wall.

My own connection with this case was that of examining surgeon in the receiving ward.

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